

When spread at the maximum application rate of 3.6 ton/450 ton and incorporated as described above, LWR solids will make up 0.8% of the total soil in the top 3 inches on the field.

For purposes of the worst case scenario, we used 5 ton per year maximum annual soil loss. Using the worst case scenario, 0.8% of 5 tons equals 80 pounds per acre of potential LWR solids loss on an annual basis.

Total additive Concentration

The forward flow through the Livestock Water Recycling system, ("LWR") is estimated to be 264,000 gallons per day.

Fiber solids are separated in the primary stage of the separation system. After fiber recovery, the remaining manure is exposed to the polymer additive in the LWR for further solid separation. The polymer is added to the flow of approximately 264,000 gallons per day of wastewater from the sand separation and manure separation system. PAC is added to the LWR process stream at a concentration of 1,920ppm, polymer LWR#17 is added at a concentration of 250 ppm, LWR#12 is added at a concentration of 40ppm, thus chemical additive total concentration is at 2,210 ppm, yielding 4,865.89 pounds per day of polymer.

The LWR system will produce approximately 220,176 lbs of solids per day at a field water content of 25% dry matter or percent solids. Assuming no reaction, thermal breakdown or degradation of the additives, the chemical additives will be at an approximate concentration of 22,100 ppm in the land applied solids at the time of application.

If we assume a 0.8% solids concentration in the top three inches of soil, then 1.768 pounds of chemical additives per acre is estimated to remain in the top 3 inches of soil.

We then approximated the actual concentration of polymer in runoff from a single rain event. A worst-case 25-year recurrence interval storm of 24 hour duration produces 4.5 inches or .375 acre feet of runoff. Using a manure concentration of 0.8%, and assuming 100% of material on the field surface would runoff directly into surface water, the concentration of chemical additives in the runoff is 1.73 ppm.

We note here that Generally Accepted Agricultural and Management Practices (GAAMPs) in Michigan require a 150 foot setback for manure application from surface waters to eliminate the potential for manure to runoff. If the 150 foot setback is included in the above calculation, the delivery potential for chemical additives to reach surface water would be substantially reduced or eliminated completely.

See calculations below.